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Air outlet for automotive air conditioner or ventilator - has double array of transverse vanes and butterfly valve, both controlled by single key via bowden cables

FOGGINI PROGETTI 19.02.85-IT-067169

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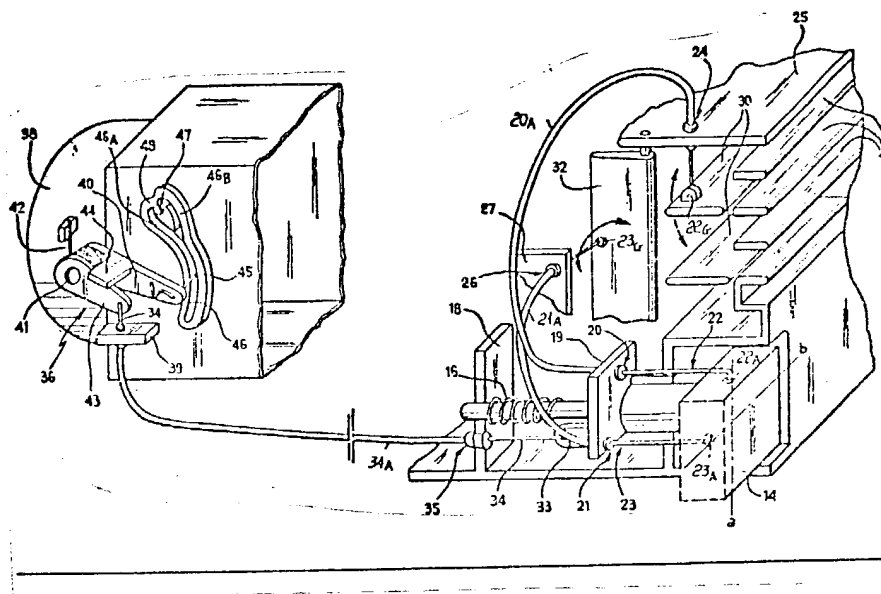
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The unit includes an/oscillatable and translatable key (14) for selectively controlling a double array of transverse vanes (30, 32) and also controlling a butterfly valve. The key oscillates about two orthogonol axes, and contacts a sprung plunger which operates a shutter valve.

The key's movements are transferred to the butterfly valve and array through corresp. flexible sleeve-type Bowden cables. The sleeves are provided, at least in part, by canals moulded into a body of an outlet fitting.

ADVANTAGE - Simplicity and reliability. (20pp Dwg No. 2/10)

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EUROPEAN PATENT APPLICATION

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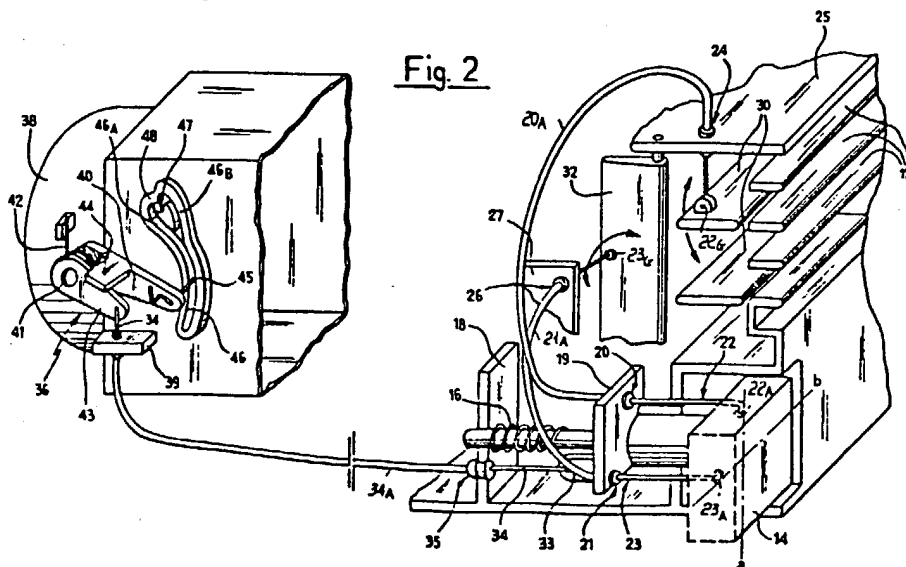
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64 Air outlet unit for air conditioning or ventilation systems in motor vehicles.

57 The air outlet unit comprises a single tilting and travelling key (14) for selectively controlling a butterfly valve and a double array of crossing vanes (30-32) adapted for intercepting and respectively directing the airflow in vertical

and horizontal planes. The movement of the key (14) is transmitted to the vanes and the butterfly valve by means of flexible sleeved cables of the Bowden type.



3 device is of the ram type.

1 9. An air outlet unit according to Claims 1 and 2,
2 characterised in that the transfer of the key movements
3 to the valve and double vane array is partly
4 effectuable by first kinematic means and partially
5 effectuable by flexible cables.

1 10. An air outlet unit according to Claim 9,
2 characterised in that it comprises a kinematic
3 transmission for controlling the valve including a
4 crank arm rigid with the valve pin, engaged positively
5 by thrust contact by the end of the key rod, said crank
6 arm being biased by a coil spring tending to hold the
7 valve in the closed position and being provided -- at
8 the remote end from that engaged by said rod -- with a
9 pin engaging a face cam with a cardioid-shaped
10 retaining projection to form a double thrust retaining
11 device.

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4 sleeve portions - of the flexible cables which control
5 the oscillation of the double array of vanes and in
6 that the end of one cable is articulated to the key at
7 a point lying on the vertical oscillation axis
8 offcentered with respect to the horizontal oscillation
9 axis and that of the other cable is articulated to the
10 key at a point lying on the horizontal oscillation axis
11 offcentered with respect to the vertical axis.

1 6. An air outlet unit according to the preceding
2 claims, characterised in that said lever system for
3 operating the shutter valve comprises a first arm
4 keyed to the pivot pin and biased by a hairpin spring
5 and a second arm, freely rotatable on the pin, adapted
6 to engage positively with an entrainment wing carried
7 on the first arm; the control cable acting on said
8 second arm.

1 7. An air outlet unit according to the preceding
2 claims, characterised in that it comprises a first
3 vertical lay lever system for controlling the
4 horizontal vane arrays, a second horizontal lay lever
5 system for controlling the vertical vane arrays and a
6 third horizontal lay lever system for controlling the
7 valve; said first and second lever systems being rigid
8 for translation with the key; said third lever system
9 being provided with a right-angle crank-and-slot link
10 adapted to allow the key to return when the valve is
11 held back into the open position by the action of a
12 double thrust type retaining device.

1 8. An air outlet unit according to Claim 7,
2 characterised in that said double thrust retaining

CLAIMS

1 1. An air outlet unit for air conditioning or
2 ventilation systems in motor vehicles including a
3 butterfly valve and a double array of relatively
4 transversely arranged vanes for intercepting and
5 respectively directing a flow of air in vertical and
6 horizontal planes, characterised in that it comprises a
7 single oscillable and translatable key for selectively
8 controlling said double-array of vanes and said valve;
9 and means for selectively transferring the key's
10 movements to said vanes or to said valve.

1 2. An air outlet unit according to Claim 1,
2 characterised in that the key is a tilting one and
3 secured, for oscillation about two orthogonal axes, to
4 the end of a plunger rod biased by a spring; the key
5 oscillation about each axis being utilised to
6 selectively move the corresponding vane array, the
7 translation of the plunger rod to move the shutter
8 valve to the open or closed positions.

1 3. An air outlet unit according to Claims 1 and 2,
2 characterised in that the key movements are transferred
3 to the valve and vanes through corresponding flexible
4 sleeve cables of the Bowden type.

1 4. An air outlet unit according to Claim 3,
2 characterised in that the sleeves of the flexible
3 cables are provided at least in part by canalisations
4 moulded in the body of the outlet fitting.

1 5. An air outlet unit according to Claims 1 to 4,
2 characterised in that said rod carries rigidly
3 associated therewith a small plate for the sleeves or

and in that the other end of the cable acts on a lever system rigidly associated with the valve pivot pin;

5 An air outlet unit, characterised in that said first arm of the lever system for operating the shutter valve carries an end pin which engages with a face cam with an upward run and a downward run of the pin being separated by a retaining projection of cardioid-like shape forming a double thrust drive;

10 An air outlet unit, characterised in that said cardioid-shaped projection is provided with a notch intended for receiving the pin of the first arm to retain the arm itself in the shutter valve open position and in that, upwardly of the notch, a tip is provided which is adapted to deflect the pin in the
15 downward run of the face cam on said pin being urged to leave the notch;

 An air outlet unit, characterised in that the tilting key is secured to the plunger rod by means of a cardan type of swivel joint;

20 An air outlet unit, characterised in that said key and rod are of unitary construction of a polymeric material and connected by at least one peduncle forming said swivel joint;

25 An air outlet unit, characterised in that the movements of the tilting and translatable key are transferred to said valve and vanes by kinematic transmission means acting selectively on the respective driven members.

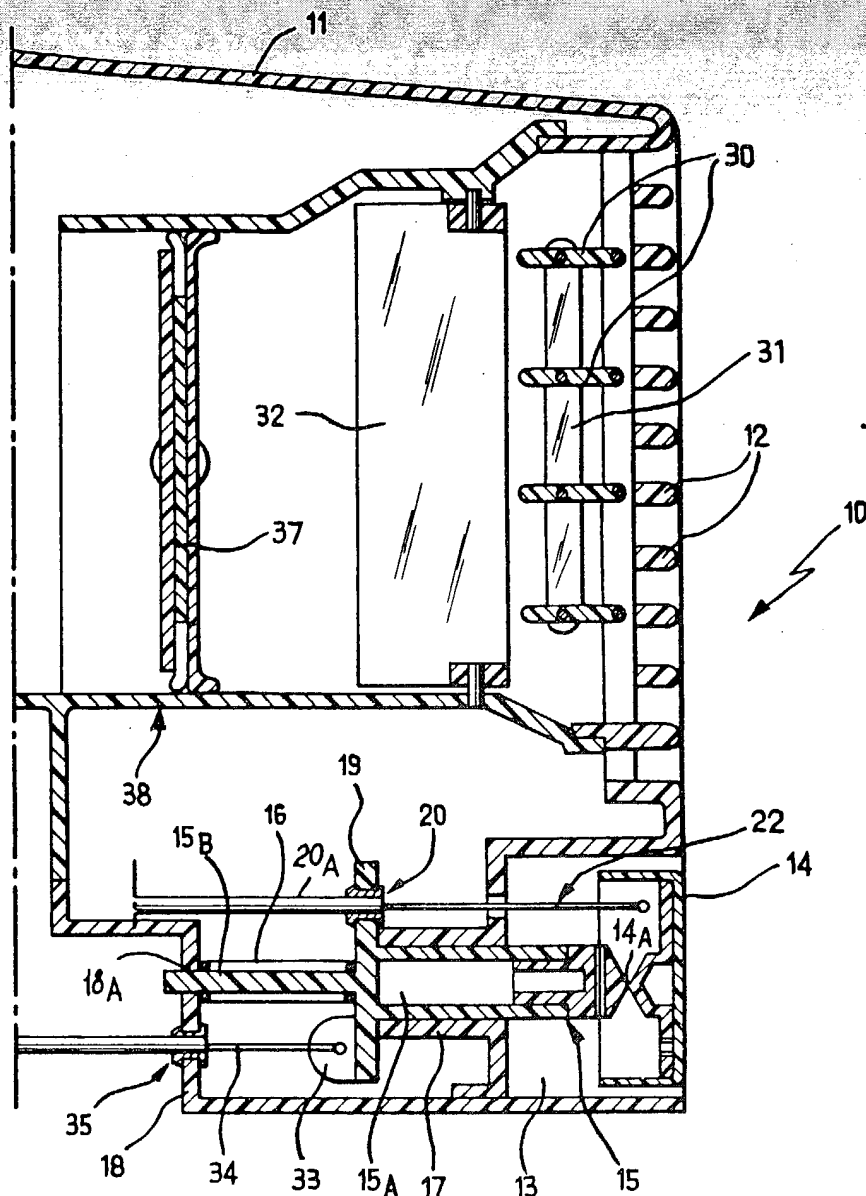
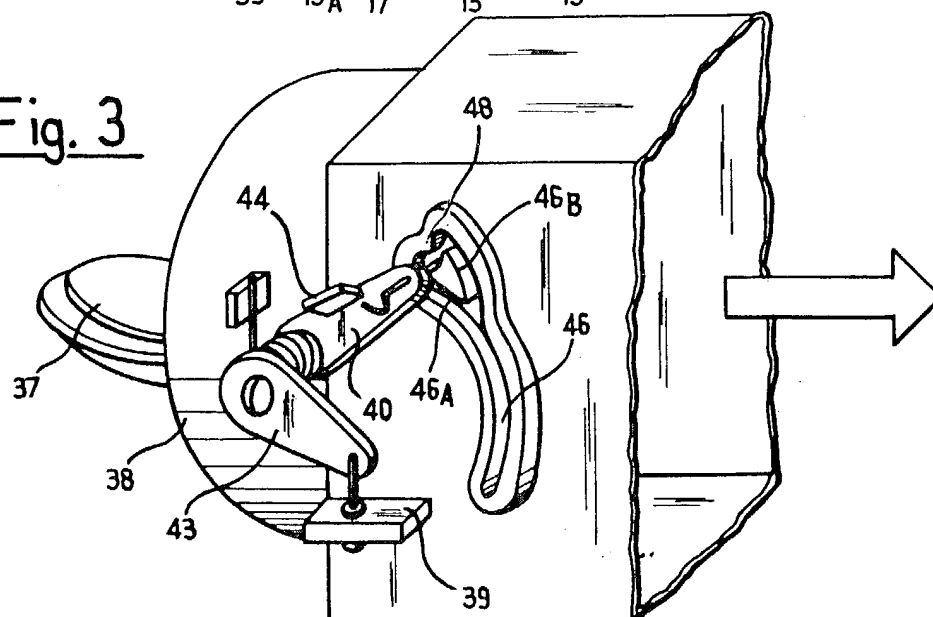
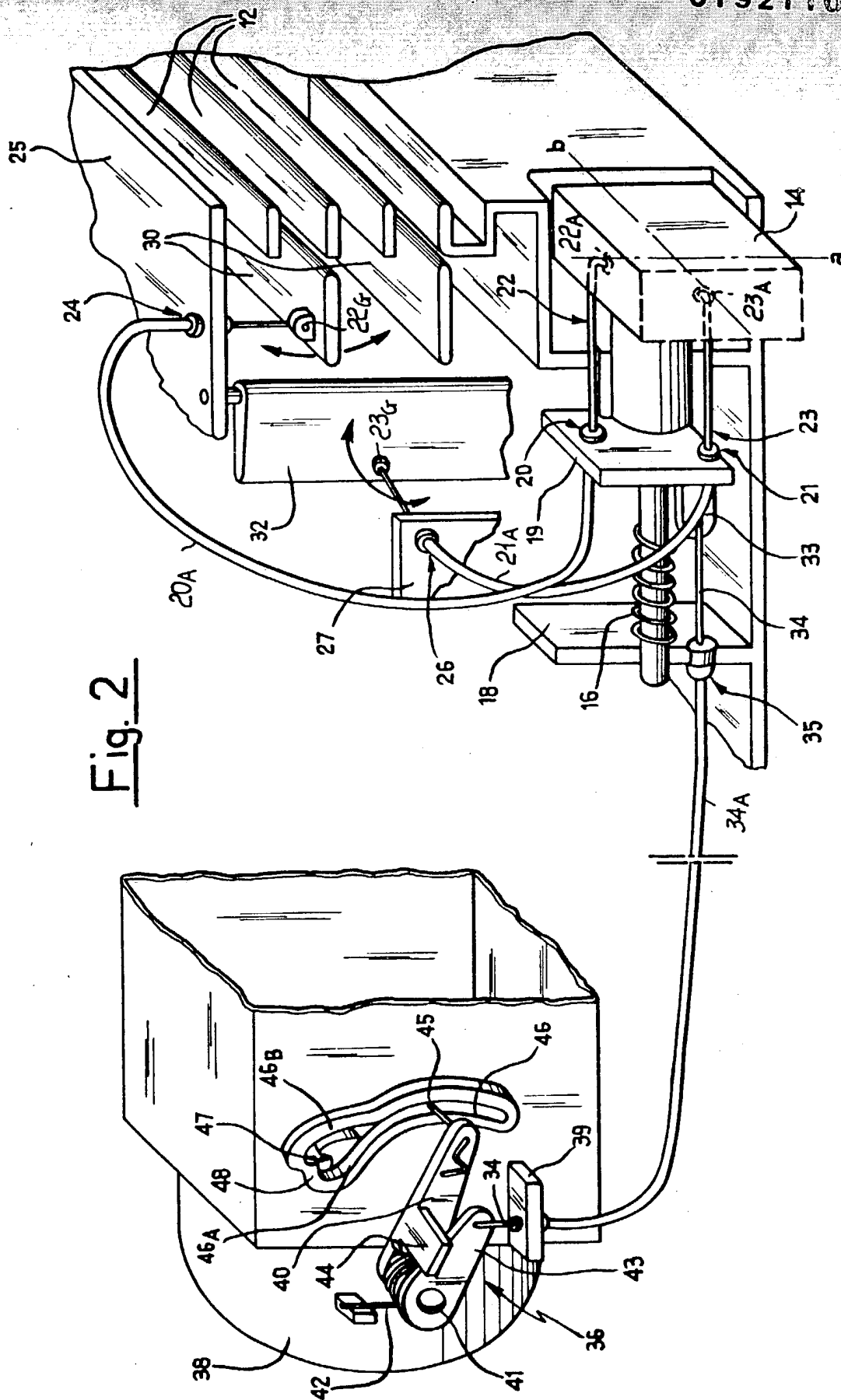
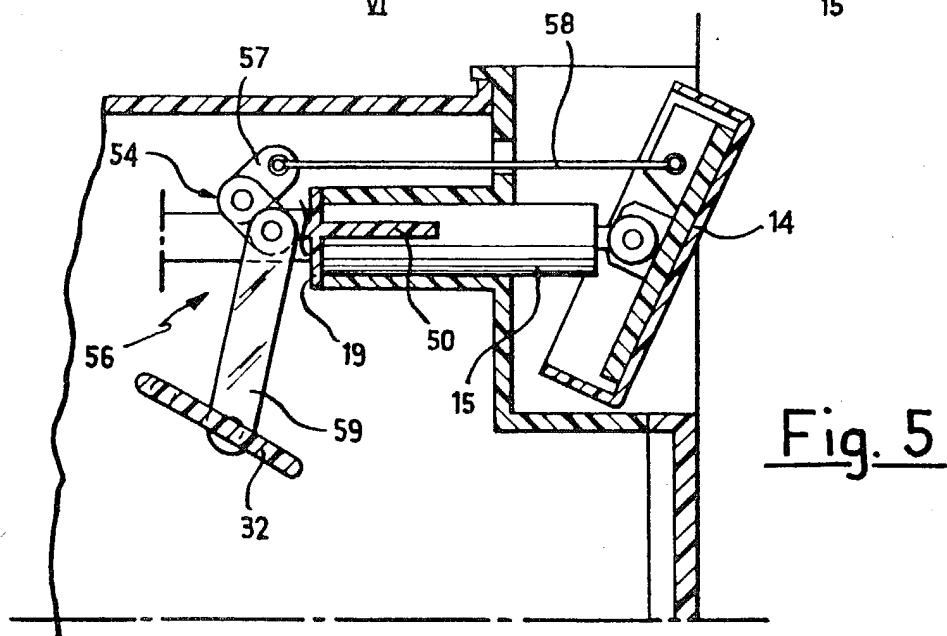
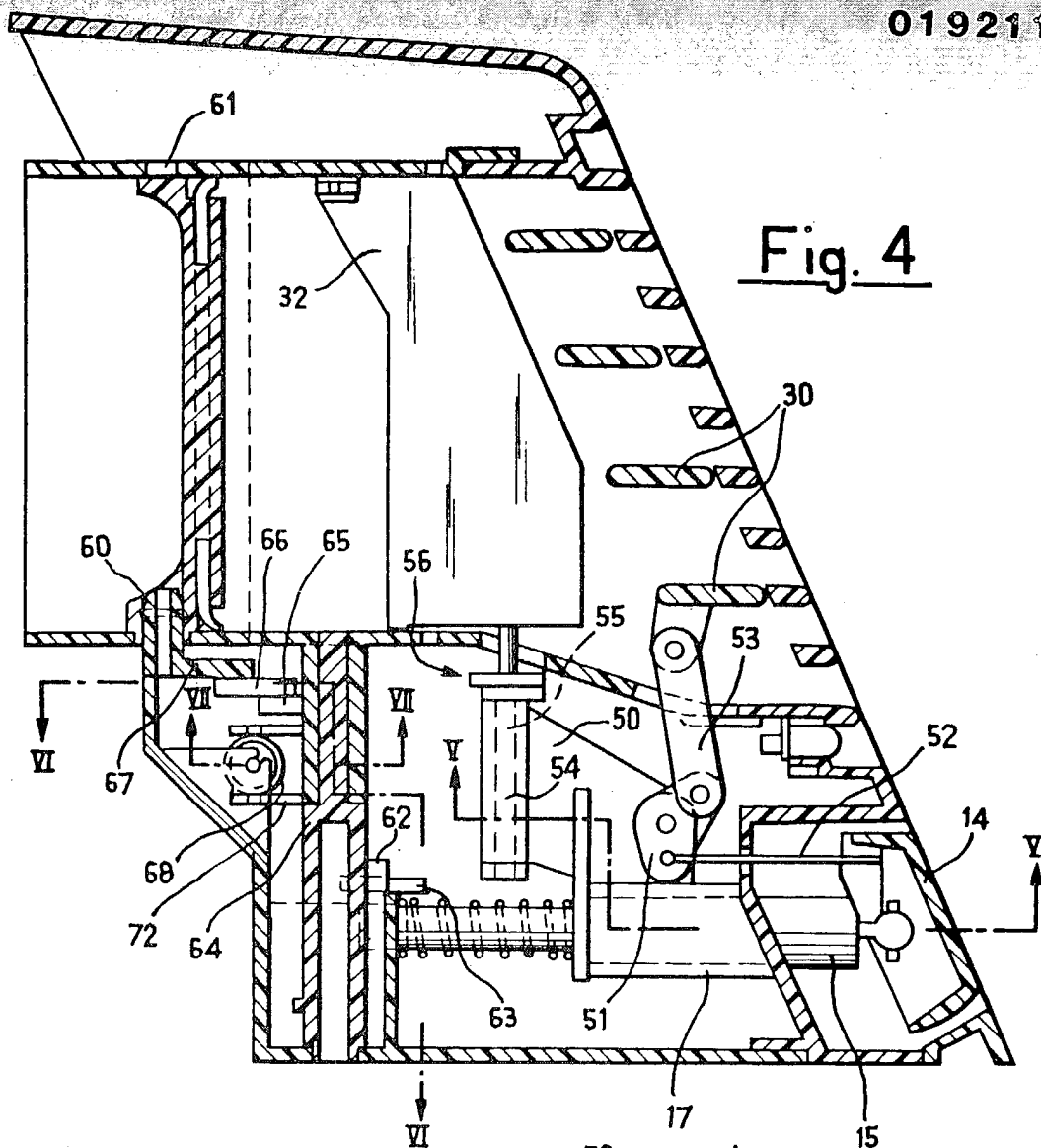


Fig. 1

Fig. 3







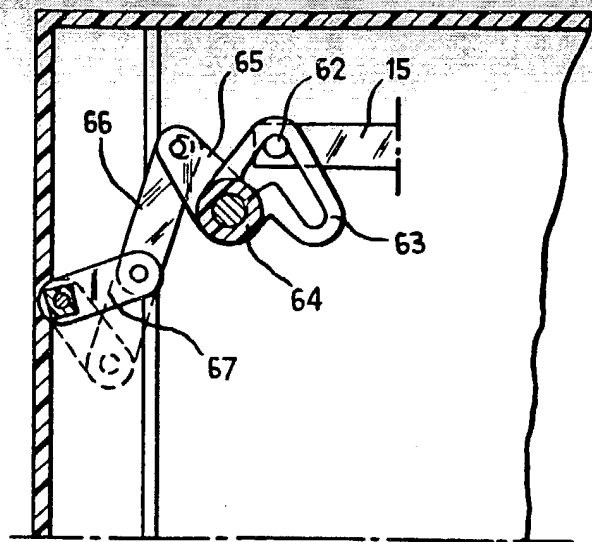


Fig. 6

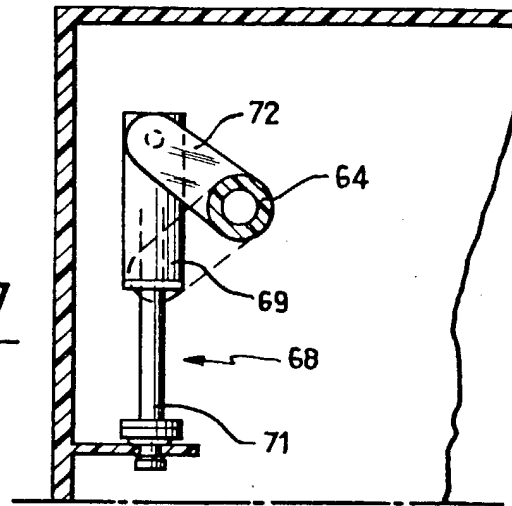
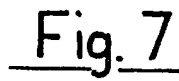


Fig. 8

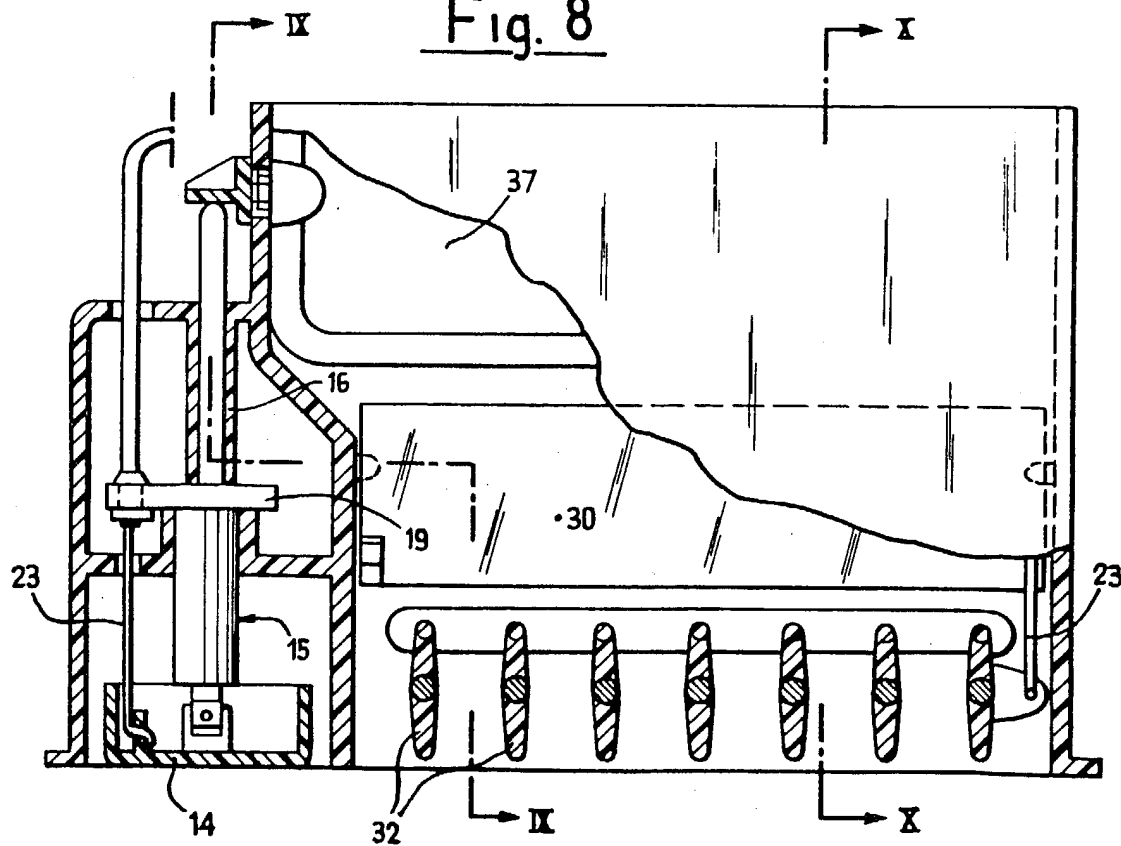
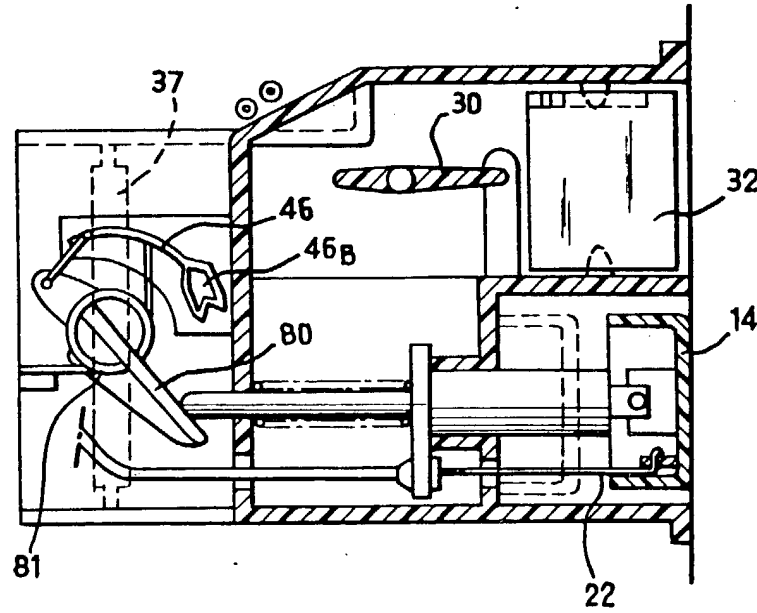


Fig. 9Fig. 10